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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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|-----------------|-------------|----------------------|---------------------|------------------|

09/655,755

09/06/2000

Anders Eriksson

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05/24/2005

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EXAMINER

CHANG, EDITH M

ART UNIT

PAPER NUMBER

2637

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/655,755

Applicant(s)

ERIKSSON, ANDERS

Examiner

Edith M. Chang

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments/Remarks

1. Applicant's arguments filed on December 28, 2004 have been fully considered but they are not persuasive. The rejections of claims 1-4, 6-14, 16-22 are upheld.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 7-8, 10, 13-14, 17-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freed (US 5,686,683) in view of Levien (US 5,337,264).

Regarding claims 1, 7, 10, 13, 17 & 20, in FIG.1, FIG.3 and FIG.4, Freed teaches an inverse transform additive sound synthesis system and its method. In FIG.4, first, the interpolation 181, build spectrum, and transform domain filtering 185 (or TAB 2, blocks 10, 20 and 40 FIG.1) decide a discrete Fourier transform representation with zero-padded of a filter (column 2 lines 15-23 & column 7 lines 30-37); second, inverse transform 173 (or IFFT 50 FIG.1, column 2 lines 55-57) transforms the filtered spectrum into a time-sampled representation (column 7 lines 41-45); third, overlap-add 175 is applied with the time-sampled representation.

Freed does not explicitly specify the details of the overlap-add, however Levien teaches the overlap-add time reversal filter technique in FIG.4 & FIG 6. In FIG.6, a circular buffer 188

Art Unit: 2637

(column 5 lines 19-23) supplies the segment samples 192 pulsing overlap samples 194 (column 5 lines 8-10) to the shortened length IIR filter 184 (column 4 line 67-column 5 line 5 & lines 19-23). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement the Freed's overlap-add block with Levien's teaching to employing infinite impulse response (IIR) filters to minimizing computational complexity (column 2 lines 15-21) and having a real time processing (column 2 lines 9-12).

The modified/combined Freed's system with Levien's teaching teaches third, circularly shifting the time-sampled representation (segments), fourth, applying a shortening window (IIR) to the time-sampled representation to produce a zero-padded reduced output from the desired system (filter); and fifth, an input signal (sample 10 FIG.1, user inputs FIG.4 '683, 22 FIG.2 '264) convolves with the reduced length filter in time domain (FIG.2 '264).

Regarding **claims 2, 8, 14 & 18**, the modified/combined Freed's system with Levien's teaching teaches shifting the removing leading/tailing zeros (column 5 lines 35-36, lines 47-50).

Regarding **claim 3**, Freed teaches the noise suppressing spectral subtraction algorithm forming the discrete Fourier transform representation (output of block 40 FIG.1, output of 79 FIG.3 wherein the noise/broadband synthesis is detailed in FIG.5).

Regarding **claim 4**, Freed teaches the frequency selective non-linear algorithm for a realistic sound (human voice with echo cancellation, column 1 lines 17-24 & lines 45-49) wherein the frequencies are selected for the discrete frequency algorithm.

Art Unit: 2637

4. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freed (US 5,686,683) in view of Levien (US 5,337,264) as applied to claims 1 and 13 above, and further in view of Leitch (US 5,202,900).

Regarding claims 5 & 15, Freed does not specify the shortening window being a Kaiser Window, however in FIG.2B Leitch teaches the Kaiser window (column 3 lines 38-50). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Kaiser window taught by Leitch as the shortening window to avoid the excess splatter in the signal (column 3 lines 44-46) in order to have a more actuated filtered/windowed signal.

5. Claims 6, 9, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freed (US 5,686,683) in view of Levien (US 5,337,264) as applied to claims 1, 7, 13 and 17 above, and further in view of Craven (US 5,548,286).

Regarding claims 6, 9, 16 & 19, Freed does not specify further shifting the reduced length filter and the minimum phase filter, however Craven teaches the minimum phase filter removing the leading zeros in an analogue and digital convertors in FIG.1. In FIG.2 (C) the detail of block 30 comprise a minimum phase filter 34 (column 7 lines 21-28), one arrangement of the filter 34 is shown in FIG.13 (column 5 lines 9-10) wherein the leading zeros in the filter response is cancelled by the filter (column 17 lines 25-30). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to implement the Freed's A/D with Craven's teaching to have a more accurate convertor (column 3 lines 45-46, 54-60).

Art Unit: 2637

The modified/combined system further shifts the reduced length filter to remove the leading zeros and transforms the reduced length filter further to a minimum phase filter of an audio output (AUDIO FIG.1 '683).

6. Claims 11-12 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freed (US 5,686,683) in view of Levien (US 5,337,264) as applied to claims 7 and 17 above, and further in view of Picchi et al (US 4,547,889).

Regarding **claims 11-12 & 21-22**, Freed does not specify the convolution in the frequency domain by using an overlap-add method, however Picchi et al. teaches an adaptive equalizer in the discrete frequency domain comprising a filter operating by the overlap-save (or overlap-add) method (Abstract) in FIG.2 (column 6 lines 40-45), wherein the overlap-saved time domain representation (output of block 14) is transformed to discrete frequency domain by DFT 15 (column 2 lines 65-68). At the time of the invention, it would have been obvious to a person of ordinary skill in the art have the frequency transform taught by Picchi et al. in the modified/combined Freed's system with Levien's teaching to receive/convolve the time domain representation in frequency domain by using the overlap-add (or overlap-save) method for the purpose of not only simplification but also of using the sample transforms for other subsequent processing operations (decoding, synchronization etc (column 2 lines 28-34).

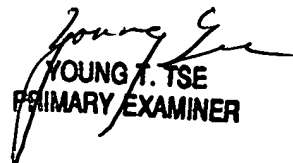
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M. Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

Art Unit: 2637

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
May 16, 2005


YOUNG T. TSE
PRIMARY EXAMINER